

DOCUMENT RESUME

ED 346 947

PS 018 248

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TITLE Messages from Invulnerable Children in Asian Villages: The Conditions That Protect Development.
PUB DATE Jul 89
NOTE 18p.; Paper presented at the International Conference on Early Education and Development (Hong Kong, July 31-August 4, 1989).
PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *At Risk Persons; Child Rearing; *Children; Early Intervention; *Family Influence; Foreign Countries; *Home Programs; *Individual Characteristics; Individual Development; Nutrition; Poverty; *Regional Characteristics; Stimulation
IDENTIFIERS Asia; Indonesia; Protective Services; *Resilience (Personality)

ABSTRACT

Over the past decade, there has been a worldwide search for caretaking factors which protect children from poverty, poor health, and neglect. This search has shifted in focus from unchangeable risk factors to conditions and behaviors that can be taught to caregivers. These conditions seem to be: (1) based in species-wide needs; (2) specific to regional variation in village and urban settings; or (3) extant in particular cultural contexts. In this presentation, an ecologic framework is used in a consideration of interacting levels of risk and protection: from the child, to the family, to community and national levels. Seminal works of Sameroff and Chandler, Rutter, and Werner are reviewed. Also considered are field reports from research and intervention programs from developing countries. Research on the caretaking correlates of child growth and development in 12 villages in Central Java is used to provide a case example of the use of information on optimal development in program design. The presentation attempts to draw together current knowledge about protective factors, with special attention to verbal stimulation, emotionally responsive caregivers, and opportunities to explore the environment. The presentation attempts to identify behaviors which equip children to cope with adversity and which are transmittable without major social upheaval or expense. (RH)

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MESSAGES FROM INVULNERABLE CHILDREN IN ASIAN VILLAGES:
THE CONDITIONS THAT PROTECT DEVELOPMENT

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Over the past decade there has been a worldwide search for caretaking factors which serve to protect children from the ravages of poverty, poor health, and neglect. This search, which is occurring in the Asian region as it is in much of the developed world, has turned our focus from unchangeable risk factors to conditions and behaviors which are changeable and thus can be taught to caregivers. Some of these conditions appear to be based in species wide needs; others are specific to regional variations in village and urban settings; still others exist in particular cultural contexts. In this presentation an ecologic framework is used for considering interacting levels of risk and protection; from the child, to the family, to community and national levels. Within this framework the seminal works of Sameroff and Chandler, Rutter, and Werner are reviewed and triangulated with field reports from research and intervention programs from developing countries. Research on the caretaking correlates of child growth and development in twelve villages in Central Java is used to provide a case example of how information on optimal development can be used in program design. The presentation attempts to draw together what is currently known about protective factors, with special attention being paid to the importance to the developing child of verbal stimulation, emotionally responsive caregivers, and adequate opportunities to explore the environment. Throughout, the attempt is to identify the behaviors which equip children to cope with adversity which are transmittable without major social upheaval or expense.

Paper presented at International Conference on Early Education and Development, sponsored by K.C. Wong Educational Foundation, UNICEF, Bernard van Leer Foundation, and High/Scope Foundation. Hong Kong, July 31- August 4, 1989.

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There are two major reasons why conditions of risk and invulnerability are currently receiving attention in developing countries: the higher rates of child survival and the decreasing numbers of traditional caregivers. In many parts of the world massive child survival initiatives have worked to greatly increase child survival rates. Once programs and technologies for child survival (immunization, rehydration, feeding programs, and basic health) are in place, the quality of life for the surviving children becomes a pressing concern. It is important to recognize that environments which formerly placed children at risk of death contain the same debilitating circumstances which place children at risk of delayed development (Myers and Hertenberg, 1987).

In addition to the declining mortality rates which have allowed attention to be paid to the delayed development among marginal survivors, the dwindling availability of those who care for children in developing countries is of major concern (IDRC, 1988). Growing pressures on women's time leave less time available for child care as women join the labor force in increasing numbers. The extended family has been dissipated by urbanization and migration which isolates children and their primary caregivers from extended family support and sibling caretakers now attend school. Thus the youngest and most vulnerable children are exposed to decreased levels of adequate care.

To understand how levels of risk and protection function, Bronfenbrenner's (1979) ecology of human development provides a useful framework. The ecologic context of development may be conceived of as an array of concentric circles. In the innermost circle one finds the developing child and family; the family is in turn embedded in a system of relatives, friends, neighbors, and acquaintances. These relationships are then enclosed in the larger social structure made up of villages, social organizations, preschool intervention programs, and so on. This is a transactional model in which the outcome of development is a result of interaction between the child and the environment as it changes across time. This implies that interactions occur between and across levels so that changes in one part of the system impact upon other parts of the system. In operation this means that to improve the situation of the child one must work with the child and his family as well as with the neighborhood or village in which the family operates. Changes in the family, neighborhood, or village, in turn will change, and be changed by the larger social structure.

What are the major parameters of developmental risk?

There have been many studies that outline the origins of delayed development, school failure, and poorly adaptive adult functioning. We know that poverty, parental neglect, and poor physical and medical care severely damage development for most, if not all, children who are exposed to such risk factors. Of

particular, if recent, fascination are the children who come through a host of damaging circumstances to function as adaptive and stable adults. It is this resilient group which may teach us a great deal about prevention and treatment. As Michael Rutter (1978) has pointed out, it is unrealistic to assume that we can protect all children from discord, rejection, and other serious hazards. It is more likely that we can introduce some buffering factors to alter the balance so that children in high risk environments will benefit.

In the next section, we will consider risk factors and conditions which protect development. First, factors which appear to be based on species wide needs will be considered, followed by a review of information on ways of producing resilient children in the Asian region.

Deviant developmental consequences arise from characteristics of the child (reproductive risk, temperament), the caretaking environment (disadvantage, mental health, family stress), and most importantly from the interaction of the child's characteristics with those of the environment (Sameroff and Chandler, 1975). The well known study of the children of Kauai (Werner, Bierman, and French, 1971; Werner and Smith, 1977, 1982) illustrates the process. The Kauai sample of largely lower SES children were followed from birth to eighteen years of age. Even with serious early biological risk children frequently showed no long term problems unless their environments also included poverty, family instability, or poor maternal mental health. In the Kauai study the impact of disadvantage became progressively more apparent as the children grew older. The data from Kauai and other longitudinal data show that beyond the second year of life those aspects of cognitive development which are language mediated, steadily decline in disadvantaged environments (Golden and Birns, 1976; Broman, Nichols, and Kennedy, 1975; Sameroff, et al., 1982; Sameroff and Seifer, 1983). Other high risk factors which function in high risk environments include: the illness, absence, or death of a parent; an unstimulating environment, particularly one low in language stimulation, and the emotional rejection of a primary caregiver (Pollitt, 1984; Rutter, 1979). An important finding is that children who suffer one of these risk factors generally come through unscathed; in an interactive effect when two stresses occur together the risk goes up fourfold (Rutter, 1978).

What is different in the lives of children who rise above risk and disadvantage?

The 1982 report on the children of Kauai concentrated on the resilient children; those who were at high clinical risk at age two but who had not developed problems by 18 years of age. In line with many other studies (Sameroff and Chandler, 1975) "protective" factors were found both in the child and in the environment: low levels of family conflict, small family size, fewer life stresses, and supportive assistance. It is noteworthy

that many of the protective factors had to do with the availability of social support to the child and the child's ability to make use of that support: positive parent-child relationships, positive relationships with another adult, availability of caretakers in addition to the mother; care by the extended family, and close peer relationships. Other studies underline the interactive impact of support; when low support is combined with low levels of maternal education and high stress the quality of mother-child interaction declines as do intellectual and language development during the first four years of life (Bee, Barnard, Eyres, Gray, Hammond, Spietz, Snyder, and Clark, 1982). Additional protective factors reside within the child's physical makeup and temperament: a child who is physically strong, with a high activity level, and who is socially responsive is less vulnerable to the impact of a hazardous environment than is the physically weak, inactive or withdrawn child.

What risk factors operate among Asian children?

While many of the global risks described above are also mentioned in field reports from the Asian region the relative emphasis tends to be different. In developed countries concern focuses on emotional and cognitive functioning, in developing countries concern must be first with the physical risks that threaten survival and for the survivors, that threaten development.

In developing countries malnutrition is among the most serious of risk factors, with highest vulnerability being for later born children of large families (Cravioto, DeLicardie, and Birch, 1966). Reports from the Philippines, India, and Indonesia describe how disadvantaged and minority status are related to physical risk, as well as to cognitive and language delays (Guthrie, 1962; Mowhite, 1986; Satoto, 1986).

At a conference which looked at the "Learning Environments of Early Childhood in Asia." (IDRC, 1988) the risk of low language stimulation was the single feature of the child's environment most frequently mentioned by participants. While the value of verbal stimulation for verbal ability and ultimately for school success was not disputed, Swaminathan (1986) pointed out that in Asia, both home and school expect children to answer questions but not to ask them, to be silent, and acquiescent. This is related to "respect behavior" which dictates that the child be inhibited from questioning adults (Wazir, 1981; Background paper, Malaysia, 1986) and is more pronounced in large families (Niyotham and Niyomtham, 1973; Niampia, 1978); and the most traditional of cultural settings which tend to inhibit the practice of new skills (Sadli, n.d.). An issue is then combining the value placed on respectful children with the demands of schools for highly verbal children.

At the same conference on early learning environments the relationships among social isolation, low maternal responsiveness, reciprocity and developmental failure was mentioned in reports from India (Graves, 1976), Indonesia (Satoto and Colletta, 1986); Nepal (Graves, 1978), the Phillipines (Razon, 1981), and Thailand (Sanhachawee, Suvannathat, and Khammanee, 1986). That maternal rejection of children is a worldwide problem is documented in studies from the United States (Colletta, 1979; 1981) as well as by Rohner's studies of 200 cultures including many from the Asian Region (Rohner, 1975). Such low maternal attentiveness places children at high risk for emotional, developmental, physical and nutritional failure; once the downward spiral begins the child's irritability, lethargy, and withdrawal add to the risk in an interactive cycle.

It is frequently pointed out that the Asian child in urban squatter slums are at highest risks as the freedom afforded their rural counterparts to explore, experience, and interact with adults is severely limited (Ratnaike, 1986; Wazir, 1979). Slum children are also most likely to left unattended by their working mothers.

What produces resilient Asian children?

Although evidence is largely based on field observations rather than on longitudinal data, the resiliency factors which operate in Asia appear to include (Cruz, 1979; Dash, 1982; Landers, in press; IDRC, 1988; Sadli, n.d; Swamianthan, 1986):

- o high value placed on children and female commitment to mothering
- o emotional security and close bonding with the mother
- o intense caretaking high in tactile stimulation during the first years
- o high attachment and belonging fostered by involvement in a family based reciprocal social network and with multiple family caregivers
- o learning by observing and interacting with adults
- o emphasis on self-reliance and self-help skills
- o high manual dexterity and attentiveness to changes in the environment

What does this information on risk and protective factors mean for program development?

For purposes of program planning, it is useful to conceptualize the risk and protective factors along a continuum which varies in the ease to which the factors may be changed or modified by social or programatic efforts. Unchangeable risks may be thought of as those factors in the child's life which though detrimental to development are either beyond the scope of programs to change, or are changeable only at prohibitive social or monetary cost. Examples of these factors are the size of the family, conditions of extreme poverty, or living in a single parent household. At

the other end of the continuum are those factors in the child or caretaker which are susceptible to educational or supportive efforts. Among these changeable behaviors are: parental caretaking behaviors, quality of language stimulation, health care behaviors, and adult understanding of child development needs. In the child, factors which both facilitate resiliency and are potentially changeable are; language, sensory and motor skills; problem solving and self-help skills; feelings of autonomy, self-esteem, and locus of control. In between the two extremes are those risk factors which may be "managed" even if they may not be directly changed. Among these "manageable" factors are those of the child's: temperament, activity level, social orientation, and physical strength.

Each level of risk carries with it its own programatic demands: the unchangeable factors may be used to screen those children who are at highest risk for developmental failure; the manageable factors such as birth conditions and temperament may be written into variations in curriculum design to take the needs of individual children into account and the changeable behaviors in the micro environment are the primary focus of program efforts.

 FIGURE 1. RISK FACTORS ON A CONTINUUM OF SUSCEPTIBILITY
 TO CHANGE

Unchangeable Risks	"Manageable" Risks	Changeable Risks
Family Size Single Parent Poverty	Social Orientation Activity Level Physical Strength Nutritional Status	Parental Caretaking Stimulation Child Language Problem Solve Self-help

Data from developing countries demonstrate that it is possible to intervene to change caretaking behaviors of families caught in the grip of unchangeable risks. Myers and Hertenberg (1987) reviewed the effects of 18 early intervention programs in developing countries. They concluded that most, if not all, early childhood intervention programs have an effect on making children more alert, sociable, curious, and well prepared for primary school. Consistent with the findings from the United States, children from the most deprived backgrounds (lower income, more socially distressed) tend to benefit the most from program participation. Long term effects on school performance are less encouraging; initial adjustment to school is better, but long term impact seems to be overwhelmed by the limitations of the schools the children enter. Most projects are also able to

demonstrate a change in caretaker knowledge of child development, nutrition, and health. Some have also reported positive effects on caretaker confidence and satisfaction.

Of particular interest are three cognitive stimulation programs which report the maintainence of gains in developmental scores for children at high risk due to poor nutrition. One program, the Cali Project (McKay et al., 1974; 1978) used an intensive and expensive center based approach with impressive effects on cognitive development; effects which were more intense the longer the intervention lasted (up to nine months) and which were largely maintained when the children were retested at 10.5 years of age. Two other projects, the Bogota Project (Herrera et al., 1980; Sellers, et al., 1982) and the Jamaica Project (Grantham-MacGregor et al., 1979; 1980; 1983) used a more cost effective home visiting model in which weekly visits were paid to homes where mothers were helped to structure play with their children. In the Bogota Project supplementation and maternal education were found to have a variety of effects on cognitive development (Waber et al., 1981), while the maternal tutoring program had specific effects on maternal behavior (Super et al., 1981). Four years later the maternal tutoring program had a marginal influence on preschool test scores and on passing in school and was associated with an advantage in height and weight being equal to the effect of supplementation (Herrera and Super, 1983). After twenty-four months of weekly home visits the children in the Jamaica project were ahead of children who did not receive intervention in every subscale of the Griffiths (Grantham-MacGregor et al., 1979, 1980, 1983).

It may be argued that home intervention projects are effective because they involve the parent and child in interaction around cognitive challenging tasks; they capitalized on the enduring emotional attachment between the child and the parent, and they train the parent-child system in interactions that foster continuing growth. Intervention programs which change the child's enduring micro environment--in this case through intervention in changeable caretaking behavior--are the best bet for having a long-term impact on the child.

In summary, most projects reviewed identified the unchangeable risks which have the most devasating impact on children. The projects also demonstrated that the more severe these risks, the more the children need and can benefit from supportive interventions. Where attention was paid to variations with in the risk populations, or to the "manageable" risks it tended to focus on the level of major survival risks of health and nutritional status. The program implications of the variations in tempermental needs of children within high risk populations has yet to be considered, a point we will return to later. Finally, changeable parent and child behaviors were the subject of many interventions with positive developmental gains, particularly when attention was paid to changes in parent-child interaction.

The interventions reviewed were most often broad based efforts to change parent and child behaviors and most frequently used Western curriculums and models of development. However, the reality of monetary and manpower constraints in developing countries dictates that effort be directed at a few behaviors which have both a high probability of changeability and highest potential for impact on the developing child. As the cultural acceptability and developmental impact of specific change efforts will vary from community to community programs need to be based on a study of the home and community environments in which children must function. Once a hierarchy of changeable correlates of development is identified, it should be possible to help the mothers whose children are developing well to transfer their skills to the mothers of poorly developing children within the same village.

To test this premise the following steps are necessary:

- o observe the range of caretaking as it naturally occurs in village homes
- o measure the growth and development of children in the same homes
- o find the major caretaking correlates of child growth and development
- o identify those caretaking behaviors that are likely to be changeable
- o test the impact on child development of teaching the identified caretaking behaviors to primary caregivers

Following these steps in Indonesia, Dr. Satoto collected data on the caretaking correlates of child development in twelve villages in Central Java. Analyzing this data, it became clear that even within the same village it is possible to describe differences in the homes of resilient children who were developing well as measured by mental, physical, and social development scores. Consistent with previous research, among the 253 children newborn to 24 months of age who Dr. Satoto originally studied, variations in caretaking behaviors began to predict mental and physical development when the children were 18 months old; predictions became stronger when the children reached 24 months of age.

In the Indonesian sample the mother's verbal responsivity was the best predictor of the mental development of the 24 month old children (see Table 1). For example, if the mother labelled objects in the child's environment, responded to the child's vocalizations by talking to the child, and spontaneously vocalized to the child, the child was likely to have better mental, physical, and social development. Also strongly related to good child development was the emotional responsivity of the mother. If the mother encouraged the child by showing pride in the child's achievements and affectionately supporting the child, the child in turn responded with more active exploration, more positive social relationships, and what appeared to be feelings of efficacy. Resiliency was also related to maternal encouragement of developmental advances (walking, playing catch,

singing), making occasional suggestions of play activities for the child, and giving the child household items to play with. Finally, availability of play materials was related to good development. Although the availability of toys in the child's house is an indirect measure of family income, in some families homemade toys were available even when resources were scarce. The availability of toys is often an indication that the parents support the importance of children's play.

Three critical factors in the data are then:

- o verbal stimulation
- o provision of appropriate play activities
- o positive involvement of the parents in interactions with the child

These three factors formed a hierarchy of changeable caretaking behaviors with a high probability of improving developmental outcome. They provided the basis for a demonstration intervention project (the Pandai Project) which is currently being supported by the Ford Foundation in Central Java.

The families in the project area face the risks of poverty, low educational levels, and poor nutritional status. The families are poor, with total annual monetary income falling below \$150. The families have few possessions other than lamps, radios, and mattresses. Most of the parents graduated from primary school but did not continue beyond that point and do not own land. Ninety-seven percent of the children are born at home. Over forty percent of the children's weight-for-age falls one standard deviation below the mean for the reference NCHS norms. Infant mortality varies by ecological zone; with a low of 36 per 1000 in the coastal area, to 54 in the highland area, and to a high of 88 in the lowland area. Infants in the lowland area are also at highest nutritional risk as measured by weight for age and height for age. Interestingly, wealth, as measured by access to land and material goods, was not a strong correlate of child growth or nutritional status, with the infant mortality rates and rates of poor nutrition higher in the marginally wealthier communities. Instead emotional and verbal responsiveness of the mother accounted for more of the variance in mental, physical, and social development.

Due to the variations by ecological zone, the twelve villages were stratified first by zone, with two villages from each zone being randomly assigned to intervention or control condition. Within each village the existing structure of volunteers (Kader) and their supervisors was used to select 304 children between the ages of one and four for the project.

The demonstration project had to combine the data on the caretaking correlates of good development with the realities of limited funds, limited maternal time and attention available to interact with children, and use of available program infrastructure. To meet these constraints the program made use of Indonesia's in-place village volunteer system to staff the

home visits. The volunteers, who live in the villages, were trained at the local health center, supervised by a staff of twelve volunteers who were also government workers. The volunteers visited their caseload of six families on a weekly basis for a year. Replication costs are kept to approximately two dollars per family by making use of natural materials found in the villages and using inexpensive xeroxed books and games. The home visiting activities themselves are sensitive to the mothers' need to be working in and around the house. The activities either are integrated into household chores or can be completed in a few minutes a day "on the fly".

The curriculum, designed to emphasize verbal, emotional, and play stimulation for children between the ages of one and five is written in a cartoon format. It presupposes a second grade literacy level for the volunteers and places no literacy demands on the parents. The intervention materials consist of:

- o a checklist of 130 developmentally sequenced activities for the home visitor to carry out with children between the ages of one and five
- o 130 activity cards which describe the activities in simple cartoon format
- o backup materials consisting of: picture cards, counting cards, sequence cards, paper puzzles, and a dozen wordless story books

Among the most ingenious and useful of materials were the wordless story books, which are highly prized by the families and are used to encourage family members to make up stories for their children and eventually to have the children tell stories about the pictures in the books.

To reinforce the notion that the parent, rather than the visitor, is the best teacher of the child, during each visit the visitors followed the three steps of: teaching the mother the developmentally appropriate activity, having the mother teach the child, and helping the mother plan how she can integrate the activity into her daily chores.

Final evaluation data from the project is not yet available as it is being collected this month. However, midterm field observations showed an increase in maternal interactions with the child centering around the activities, more interest in play activities; and an increase in verbal stimulation in the intervention families.

Conclusion.

This presentation highlights the importance of searching for those behaviors which serve to protect children in even the most deprived of environments. A necessary focus is on those behaviors which are changeable without major social, cultural, or economic disruptions. In this presentation we have discussed developmental risk in terms of a continuum of changeability. We have noted that with one risk factor in isolation development is often unhampered. It is the interactive effect of risks that

multiplies the damage to the child. We have concluded that programs can use knowledge of severe unchangeable risk factors to target program efforts at children and families who are most likely to suffer multiple stress.

We have given less consideration to vulnerabilities within the child or what we have been calling manageable risk factors. Even within high risk families only some of the children are damaged. To explain this fact children's biological makeup; temperamental characteristics and physical strength must be considered. For example, the temperamentally difficult child; the one who has negative mood, abnormal activity level, poor social connectedness, or poor adaptability, is the one who is likely to develop psychological and developmental problems (Thomas, Chess and Birch 1968). This is so because children with difficult temperaments are more likely to be withdrawn or hard to get along with and are more likely to be ignored or to be scolded by highly stressed parents. A similar chain of interaction occurs for the biologically vulnerable child. A child who is malnourished or ill demonstrates irritable, withdrawn, and lethargic behaviors which elicit less stimulation from caretakers than would be elicited by a normally engaging and active child. These vulnerable children may be managed by programs which expend more resources on the weak or difficult child and which provide parents with specific skills to reach such children.

In this presentation we have paid most attention to identifying those caretaking behaviors which are both changeable and likely to have the greatest impact on developmental status. Recognizing the limitations in program monies, manpower, and parental energies, we have suggested identifying a hierarchy of behaviors ordered by the factors of cultural acceptability, changeability and potential for impact. The Pandai Project in Indonesia was used as an illustration of the process of identifying such a hierarchy.

Emerging from this review is a sense of optimism about what may be done in the Asian Region to help children. This optimism is fueled by the knowledge that within each hazardous environment buffering factors operate to protect at least some children. Knowing that the process of development is enormously malleable we can expend our energies to identify these buffering factors and to teach them to parents. Programs may use our knowledge of the conditions that facilitate normal development to intervene to ensure that as many high risk children as possible emerge as competent and adaptive adults.

TABLE 1 Regression of HOME Subscales on Mental Development Index, Physical Development Index, and Social Quotient *
for 24 month old Indonesian Children

HOME	MDI	PDI	SQ
1. Emotional and Verbal Responsivity	.46 (.001) 60.05	.48 (.001) 50.24	.44 ** (.001) 48.98
2. Acceptance of Child's Behavior	-.18 (.18) 3.05	-.06 (.66) 1.28	-.11 (.56) 2.25
3. Organization of Environment	.22 (.10) 00.93	.34 (.01) 10.20	.32 (.02) 21.81
4. Provision of Play Materials	.30 (.02) 6.50	.27 (.04) 1.90	.28 (.03) 17.51
5. Parental Involvement with Child	.33 (.01) 7.56	.41 (.001) 31.23	.09 (.50) 7.85
6. Variety in Daily Experience	.32 (.01) 21.91	.26 (.04) 5.15	.11 (.60) 1.60

 *Bayley Scales of Infant Development Mental Development Index (MDI) and Physical Development Index (PDI); Vineland Social Maturity Scale Social Quotient (SQ)

**Row 1 = coefficient correlation

Row 2 = level of significance

Row 3 = amount of variance accounted for in regression

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